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A STUDY TO DETERMINE THE MOST FEASIBLE  
SIGN SYSTEM FOR IMPROVING THE FLOW  
OF PATIENTS IN THE INTERIOR OF A HOSPITAL

A Graduate Research Project  
Submitted to the Faculty of  
Baylor University  
In Partial Fulfillment of the  
Requirements for the Degree  
of  
Master of Health Administration

BY

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<p>The study determined the most feasible internal hospital sign system aimed at improving the flow of patients throughout the hospital and developed a sign system that is understandable, readable, durable, and attractive. The study conducted a literature review and developed a hospital movement control plan which aided in sign placement. In addition, a questionnaire queried patients for the current sign strengths and weaknesses. This data was then evaluated and a simple, understandable system was implemented. The study concluded that silkscreening was the most effective and inexpensive method, and so, the writer developed specific departmental signs to provide better direction. The study recommended that pictorial signs were better than written signs and recommended money be allocated to phase in an upgraded standardized sign system. <i>Keywords:</i></p>					
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"A few people will reach their destination with no signs. Most people will reach their destination with reasonable directions, but there also will be those who will get lost even when being led by the hand."<sup>1</sup>

## I. INTRODUCTION

### Development of the Problem

Letterman Army Medical Center (LAMC), Presidio of San Francisco, California, is an accredited 388-bed Federal government hospital. The main hospital, Building 1100, was opened in 1969 and consists mostly of nursing units on floors 4 through 10. Administration, ancillary services, and clinics are located on floors 1 through 3 and in the old hospital area, which is called the Annex. The Annex is located approximately 200 yards northwest of the hospital. Signs and graphics in these areas have changed little since their original planning stage; color, style, and lettering have remained basically the same for the past 16 years.

Directional signs in Building 1100 are blue with white lettering engraved by LAMC's Services Branch in Logistics Division. The Annex signs have black lettering on a white background and are painted by the Post Facility Engineers. Signs vary in size, shape, color, location, and method of attachment to the wall, door, or ceiling. Lettering varies in size, style, and method of production. There is a lack of uniformity throughout the hospital and the Annex.

In February 1982 the interior designer from Walter Reed Army Medical Center visited LAMC. She recommended hiring a contractor to design a comprehensive sign system in order to improve the overall appearance of LAMC. A design consultant from Creative Signage Systems, College Park, Maryland, submitted a proposal for \$8,800 to develop a sign system for the medical center. He had already designed a system at Walter Reed. Even though the

issue of a sign system had been discussed since 1981 in the LAMC Special Projects Committee, it was decided that the consultant should not be hired. Rather than hire a consultant, the committee decided to allow the Administrative Resident to develop a sign system. Normal fees for a consultant can run \$30 per hour or as high as \$10,000 per 100 beds.<sup>2</sup>

Since the end of the Vietnam War, a decreasing number of active duty personnel have been treated at LAMC. In addition, life expectancy of retired military personnel and their dependants is increasing. The current average patient age at LAMC is 47 years. Older patients are less ambulatory and may have poorer eyesight than the rest of the patient population; consequently, older patients take more time to move about from wards and clinics to other clinics and support services. Patients, in general, also may be preoccupied with thoughts about their medical condition. Poor directional signs and directories, confusing medical terminology, and language barriers cause patients to become lost, to arrive late for appointments, or miss appointments altogether.

These common problems have resulted not only in patient frustration, dissatisfaction, complaints, and staff discontent, but also in disruption of scheduled operations when patients arrive late and are upset. Patients who are lost also may distract other staff members from their normal duties by asking them for directions. All of this detracts from the hospital's efforts to create a friendly environment and to express concern for patients. These problems have an impact not only on staff and patients, but also on other persons, such as visitors, volunteers, and deliverymen.

Modern medical research has resulted in the invention of more and more equipment that assists the health care provider to treat patients. Additional medical equipment requires extra space, reducing the space available for storage and administrative offices. Thus, many of these functions have been relocated into space available in the Annex, and others have been relocated within the hospital itself. Several medical functions have also been relocated within the hospital and the Annex. In addition, Preventive Medicine Service and Department of Clinical Investigation have been moved to the old Public Health Service Hospital building located three miles from LAMC. The biggest single event prompting many of the moves in recent years has been the expansion of the Department of Radiology to accommodate installation of new and larger x-ray equipment and CT scanners. Because of these moves and future projected moves, appropriate signs are needed to announce changes and to guide patients to the appropriate places.

Currently under consideration for 1990 is a proposed plan to upgrade the strength of LAMC Building 1100 to meet seismic standards so that it will better withstand a large earthquake. This will be a major project and require construction of additional support walls throughout the hospital. Some of these walls will divide certain services, such as the operating room, necessitating temporary changes in the movement of staff members and patients during construction and permanent changes in their movements upon completion. A flexible and readily changeable sign system will be needed at that time in order to avoid the cost of remaking and remounting signs.

Although it is relatively easy to make a new office sign when a move is made, insuring standardization with existing signs in the new area is more difficult and rarely addressed. Directories and major directional signs must

also be changed. The aspect of patient flow must be considered, even though it is often not. For these reasons a study was conducted to determine the most feasible sign system for the hospital. The anticipated results achieved by implementing a standardized sign system are: saving of money in the long run, reduction of time spent giving directions, and expression of a sense of concern for the patients.

#### Limitations

This study is limited to the evaluation of interior directional and location signs/graphics that are aimed at assisting patients to find their own way to a specific destination in a hospital. Certain signs have set color requirements:<sup>3</sup>

1. Red--emergency, prohibition, and warning
2. Yellow--caution
3. Green--permission to go, safety, and first-aid equipment
4. Magenta--radiation hazards
5. Blue--handicapped and available information and services

Means of attachment of signs is limited by architecture, ceiling height, visibility, major traffic flow, and utilities in the ceiling. The availability of engineer personnel to install the system is also a limitation.

The primary limiting factor in this proposal is the availability of funds to purchase an entire new sign system. This may require that portions of the system be bought in phases as money becomes available. The system may have to incorporate some of the hospital's existing signs. A hospital sign project is a major effort and may easily require more than 1,000 signs. Colonel Florence



A. Blanchfield Army Community Hospital at Fort Campbell, Kentucky, required 3,175 signs to direct people throughout its 500,000 square feet of space.<sup>4</sup> With variations in type, quality, size, location, etc., reliable budget figures for a hospital sign system are virtually impossible to determine. The materials specified and the fabrication techniques required are the major cost determinants. Installation is 15% to 20% of the total cost of a sign system.<sup>5</sup>

#### Desirable Characteristics

The sign system must be standardized so that it may be readily modified for use at other hospitals. A simple and understandable system reduces patient misorientation. Use of layman terms and symbols solve language problems. An attractive system enhances the building and comforts the patients. The system must be readily changeable to allow for relocation of services. Removable inserts allow changes to be made easily and economically. These may be magnetically attached. Individual modules lend flexibility to the sign system because they can be rearranged or changed easily. A durable system avoids expensive replacement. Use of hard plastic minimizes breakage. Custom-made sign frames can be permanently mounted, and inserts can be added. Vandalism is discouraged when each sign looks like part of a unit.

#### Statement of the Problem

The problem is to determine the most feasible sign system for improving the flow of patients in the interior of a hospital, and to develop a system

that is standardized, simple, understandable, attractive, readily changeable, and durable, and also that would improve patient flow. A sign system with these characteristics would have an impact on health care administration in Army Medical Department medical treatment facilities since this system could be modified to meet the local specifications of any user.

### Review of the Literature

A good hospital sign system must communicate effectively, help to create a friendly environment, and express the concern of the hospital for its patients. A visitor entering a hospital should be able to orient himself easily. Most hospitals, however, have either too few signs that don't provide enough information or too many signs that provide too much information and are misleading. Architects and interior designers may be so bound up in analysis of function and design that the signs they design are ineffective for directing people.

An attractive and well-organized sign system will not only serve its intended purpose, but also enhance the overall appearance of a building by reducing visual clutter. Signs help serve the communication needs of an institution by providing:<sup>6</sup>

1. Movement

- a. Orientation--you are here, area and corridor designations, floors plans.

- b. Direction--you wish to go there and you get there this way.

- c. Traffic Control

2. Information--building directories and messages.

- a. Positive--you may act, mandatory instructions.
- b. Negative--you may not act, prohibitory instructions.
- 3. Advisory or cautionary--exits, safety signs.
- 4. Identification--you have arrived at your destination, room and clinic designations.

The persons who need this information are: the patients, both outpatients and inpatients; various types of visitors, such as patients' relatives and friends; delivery, sales, and service personnel; the police and the press; the medical, nursing and other staff members; and volunteers. You are telling these people something by the color, size, shape, location, and consistency of signs.

A readily understandable system of signs and graphics contributes to the smooth functioning of the institution and the satisfaction of its users. A planned system can help people move through the hospital with a minimum of delay and anxiety. It can help get them where they need to be and tactfully steer them away from restricted areas. A good system also can save time by reducing interruptions of staff by people who are asking for directions, which thus helps the hospital to function more efficiently. Money can be saved if the sign system provides for future needs with low replacement and expansion costs and if the system reduces the total number of signs required.

All of these advantages of a planned system are also reasons that fully justify a new sign system; however, the system must be consistent, efficient, economical, and flexible. A survey must first be conducted to determine the hospital's needs, problems, and preferences regarding signs, and to develop an appropriate, complete, and standardized sign system.

## Research Methodology

### 1. Planning/Data Collection Phase

a. Current literature was reviewed to learn about alternative systems that are available and meet the requirements of the problem statement.

Definitions are listed in Appendix A.

b. Sign systems at other hospitals were reviewed, and the staff members responsible for signs were interviewed. Items of concern were whether their systems are simple, understandable, attractive, durable, and flexible.

c. The sign system at LAMC was evaluated to see where it can be simplified. To test whether a sign is necessary, the following questions were asked:

(1) Must the information appear publicly?

(2) Does it make the situation clear?

(3) Does it duplicate another sign in the area?

(4) Does the situation result in confusion or misunderstanding in the absence of a sign?

d. Floor plans and overlays were used to evaluate traffic flow regulated by existing signs. Walk-throughs were performed by only following signs from one point to another. Problem areas were identified and plotted on the overlays (Appendix B).<sup>7</sup> Hospital staff were also interviewed (Appendix C).

e. A patient survey was given to 1,000 patients to appraise LAMC's current system by identifying problem areas (Appendix D). This helped to determine whether the system is simple and understandable and also if it adequately maintains traffic flow.

## 2. Evaluation Phase

a. Results of LAMC's sign survey, staff interviews, and patient survey were evaluated to determine number, locations, types, and colors for signs. Wording was simplified, and symbols were identified for use where appropriate (Appendix E).

b. A general estimate of the costs of the signs was made by performing a cost-benefit analysis of three sign production methods (Appendix F).

## 3. Design Phase

a. New signs were designed to replace existing ones. Specifications, locations, materials, methods of attachment, color, style of lettering, and wording were included.

b. A sign system manual was produced, which outlines design standards for typical situations (Appendix H). This contains drawings and guidelines for possible types of signs that may be needed in a hospital. A sample order blank is included. The manual will insure sign standardization throughout a facility.

## 4. Implementation Phase

a. A plan to implement the sign system was developed (Appendix G). Priorities were determined by the hospital commander. Budget constraints will determine which phases are implemented and when.

b. A sign control officer will be designated to contract qualified sign fabricators and to develop installation schedules. This person will be the liaison between the hospital and the contractor. Staff members will request signs through this person's office in accordance with the sign manual. The sign control officer will ensure that standardization of hospital signs is maintained through compliance with the manual and will also monitor the contractor's service, work quality, and timeliness.

## II. DISCUSSION

### Visits to Local Hospitals

Data about sign systems was gathered from the literature, interviews with personnel responsible for their facility's signs, and discussions with sign manufacturers. This information, together with that obtained from staff and patient surveys, helped to evaluate of the adequacy of LAMC's current sign system. Visits were made during the residency to the following health care facilities:

- Public Health Service Hospital, San Francisco
- Veterans Administration Medical Center, San Francisco
- Kaiser-Permanente Medical Center, San Francisco
- University of California Medical Center, San Francisco
- David Grant Medical Center, Travis Air Force Base
- Naval Regional Medical Center, Oakland

Through discussions with the key personnel responsible for the sign system at each of these health care facilities, valuable information was obtained. Important points were:

1. Adequate time spent initially to develop a comprehensive sign system resulted in fewer problems later during the implementation phase. Adequate planning also saved time and money and decreased irritation later.
2. Additional initial investment in an easily changeable system resulted in cost savings later when replacement signs were required.
3. Changeable signs reduced the need for repairing and repainting of walls.

4. Work performed by one contractor ensured sign consistency within the system.

5. Flexible mounting devices used on overhead and perpendicular wall signs reduced breakage and replacement costs.

6. Signs written in layman terms rather than in medical or technical jargon were more easily understood.

7. Readers were sometimes confused by symbols.

8. A detailed contract or manual for the sign system ensured standardization.

9. Hiring a consultant to develop a sign system was worth the expense.

#### Hospital Sign Survey

A survey of LAMC's sign system was conducted to determine adequacy of current signs. Various services were located from different starting points by following only available signs without using prior personal knowledge. Signs were evaluated on the basis of answers to the following questions:

1. Is there a need for fewer or additional signs? If additional signs are needed, what should they say, where should they be placed, how should they be grouped together, and how should they be attached?

2. Is there a shorter route from one place to another?

3. Should traffic flow be routed away from certain areas?

This walk-through analysis revealed outdated signs, insufficient signs at decision points, inadequate information at entrances, and inconsistency in size, color, location, style, method of attachment, and method of production

of signs. Signs were found to be lacking at many points where the user has a choice of direction, i.e., at corridor intersections and turnings, at stairs, in long hallways, etc. A patient survey and a staff survey were conducted to identify additional problem areas.

These trouble spots were plotted on overlays of the appropriate floor plan (Appendix B). Current user flow patterns, as directed by existing signs, were also indicated on the overlays. This sign survey included analysis of the users and the building architecture as outlined below:

#### User Analysis and Flow Management

1. Emergency
2. Inpatients
3. Outpatients (scheduled and unscheduled)
4. Staff
5. Publics:
  - Vendors
  - Deliveries
6. Special requirements and needs:
  - Handicapped
  - Bilingual
  - Socio-economic

#### Architectural Analysis

1. Primary orientation at all entrances
2. Directional information at all decision points
3. Area and room identification



4. Restrictive and prohibitive data
5. Personal hazard and safety information
6. Policy and general message signs

In May 1983, a request for comments on interior directional signs was submitted to every section of the hospital. The request solicited suggestions for improvements that would make it easier for patients, visitors, and staff to find various services. Directions commonly asked for by passers-by were included, since staff members would be distracted from their normal duties by having to give directions. Staff comments are summarized in Appendix C.

A patient survey form was prepared and distributed to 1,000 patients at LAMC. This survey was conducted in order to get patient's suggestions and to identify problems with the current signs from the patient's perspective. This survey included questions about in-house medical and technical jargon, in order to determine where layman language would be necessary. A copy of this patient survey form, together with general and detailed results of the sign survey are included in Appendix D.

As a result of these surveys and the identification of trouble spots, reasons for the problem areas were clarified, and a list of needed changes was prepared.

#### Graphics, Pictographs, and Symbols

Graphics, pictographs, and symbols were identified for use in supplementing some printed messages. Many of these are similar to international traffic symbols. Some of those relating to medical treatment

facilities were contained in the literature examined. Additional ones for medical services were devised (Appendix E).

Pictographs attract the attention of people who cannot read, refuse to read signs, cannot read English, or have limited vision. Symbols can communicate essential information without relying on words. They not only cross language barriers, but also can be recognized at greater distances, more rapidly and accurately, than the same message in words. Symbols can be instrumental in minimizing confusion among alternative choices. Response time of readers has been found to be faster for symbols, when stress was introduced as a variable. However, the temptation to overuse graphics should be resisted. If there is any chance that a symbol or pictograph will confuse rather than clarify, or that it might lead to a conclusion other than the one intended, then words should be used.

#### Cost-Benefit Analysis

A cost-benefit analysis was performed from October 26, 1983, to February 24, 1984, (Appendix F) to determine the most feasible method for manufacturing signs. Three popular methods were evaluated: silkscreening, engraving, and use of vinyl die-cut letters and symbols.

Requests for estimates on 19 different types of signs and sign modules, produced three different ways, were sent to seven sign companies. Only four companies responded. They all recommended against using engraved signs because engraving was the most expensive method of production. Since local funding for a sign system was a major constraint, the option of obtaining engraved signs was ruled out. Therefore, only vinyl and subsurface silkscreen production were compared. Cost weighed heavily in comparing the advantages and disadvantages of each method.

Silkscreening was selected as the most feasible method as a result of the cost-benefit analysis. It is cheaper and lends itself more readily to use of symbols and pictographs.

#### User's Manual for Signage Systems

A user's manual was developed (Appendix H) for use when ordering a new sign to ensure sign standardization within the hospital. It can also be used to develop a sign system and to establish a contract with a sign manufacturer. The manual outlines production procedures and contains samples of types of signs used in the hospital.

The manual contains a sample order blank that can be reproduced and used by the requestor. Additional signs ordered after initial installation of the new sign system will have to be consistent with those already installed. This will insure uniformity of color, size, format, lettering, location, and installation.

With a user's manual the signage system can be kept simple and understandable. It also allows the flexibility of modifying the system to meet the needs of other hospitals without hiring a design consultant. The standards manual provides for a readily changeable system through which signs can be quickly adapted to changes in location of services. Expensive replacement of signs is avoided with use of a durable system.

Any requests for signs are reviewed by the Chief of Services Branch in Logistics Division. The chief submits requests to the contractor or produces the signs in-house, if possible.

### III. CONCLUSIONS AND RECOMMENDATIONS

#### Conclusions

The most feasible sign system for the interior of a hospital is one manufactured by the silkscreening method. A cost-benefit analysis found silkscreening to be cheaper than either the engraving method or the use of vinyl die-cut letters. Silkscreening also lends itself better to symbols and pictographs. With funding being a major constraint in the military, the most expensive method of production can rarely be chosen.

A User's Manual for Signage Systems (Appendix H) will insure that the signs are standardized, simple, understandable, attractive, readily changeable, and durable. The main result of this system is improved patient flow, which reduces the time staff members spend giving directions. This manual can save money by reducing the need for replacement of signs. It ensures the facility has a system of signs that displays a sense of concern for its patients.

#### Recommendations

Graphics, pictographs, and symbols should be used in a sign system whenever they simplify or clarify a message.

A manual for a signage system should be used to insure standardization of signs within the hospital. The manual can provide guidance for implementing a sign system that is tailored to local specifications.

Money should be allocated to upgrade sign systems.

APPENDIX A

DEFINITIONS

## DEFINITIONS

**COPY** - Copy is another term for lettering.

**GRAPHIC** - Graphic is a general term for a man-made image containing a pictograph, typography or both.

**PICTOGRAPH** - A pictograph is a picture that represents an idea literally or an object. A figure in a wheelchair represents the physically handicapped. A pictograph should immediately convey information to anyone who understands the cultural environment.

**SIGNAGE SYSTEM** - A signage system is a group of interrelated signs working together as a total entity. It should inform and direct each user from initial contact with the facility to their ultimate destination and departure.

**SYMBOL** - A symbol is a picture of something that is generally understood and accepted as representing an abstract concept. It may be a word or sign. A caduceus symbolizes the art of healing or a physician. The arrow, used for indicating direction, is one of the oldest and most universally understood symbols. The meaning of a symbol must be learned.

**TYPOGRAPHY** - Typography is the style, arrangement and size of letters.

APPENDIX B

IDENTIFICATION OF TROUBLE SPOTS

## IDENTIFICATION OF TROUBLE SPOTS

Complex floor plans should be redrawn to show only room outlines, doors, elevators, corridors, and other major plan elements. Spaces should be identified. Drawings should indicate the various departments, such as outpatient, emergency, and radiology, reception and admitting areas, and at least one typical nursing floor. All floor plans should be drawn to the same scale. The actual numbers and types of drawings should be determined by the requirements of the particular facility.

Several transparent sheets will be needed to use as overlays on the simplified floor plans. Tracing paper or acetate sheets can be used.

The main departments are outlined on the first overlay and then blocked out, together with corridors, according to appropriate users.

Next, on the second overlay, the desirable traffic patterns for various types of users are indicated. Only staff should be in some areas; staff and patients in others; and all users elsewhere.

On the third overlay, the data obtained from patient and staff surveys are plotted by marking the trouble spots. Clusters of trouble spots that appear outside desired traffic patterns probably identify areas where the present information system is inadequate. It is also helpful to indicate the place where questions are asked. This indicates where existing signs are not clear.

On the last overlay, locations at which changes are required are marked. Trouble spots on the previous overlay will be visible. The kinds of changes that ultimately will be made will depend upon the circumstances. Changes may include new or different information or a traffic barrier such as a door. From this set of plans and overlays, the required directional signs or other forms of orientation and information can be determined.



# 2nd FLOOR

**ELEVATORS**  
P Passenger  
S Service

\*\*Diabetes  
Weight  
Control  
Hyperten-  
sion

IN MAIN  
PATIENT  
ENTRANCE

EMERGENCY  
ENTRANCE

SCREENING  
CLINIC

LOBBY  
IN OUT

E

OUTPNT  
RECORDS  
Rm 218

AMB CARE  
&  
PATIENT  
ASST  
Rm 218A

EMERGENCY  
ROOM  
Rm 219

OB/GYN CLINIC  
Rm 215

P

PATIENT  
WAITING  
ROOM

OUTPATIENT  
PHARMACY  
Rm 213

PHARMACY  
REFILLS  
Rm 216

RADIOLOGY  
Rm 217

IMAG-  
ING

ULTRA-  
SOUND  
Rm 212

NUCLEAR  
MEDICINE  
SERVICE  
Rm 210

CT  
SCAN  
Rm 201

P P

NUCLEAR  
CARDI-  
OLOGY  
Rm 223

TREA-  
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ADMS-  
SIONS  
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CLINIC  
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AIM

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CAST  
ROOM

MEDICAL  
CLINIC\*\*  
Rm 203

DIET  
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Rm 207

CARDI-  
OLOGY  
CLINIC  
Rm 209

EKG

General Medicine

W

LABORATORY  
Rm 200

Plastic Surgery  
Podiatry  
Orthopedic  
Thoracic  
Neurosurgery  
Vascular  
General Surgery

TO ANNEX

\*\*Renal  
Thyroid  
Pulmonary  
Endocrinology  
Gastroenterology  
Rheumatology

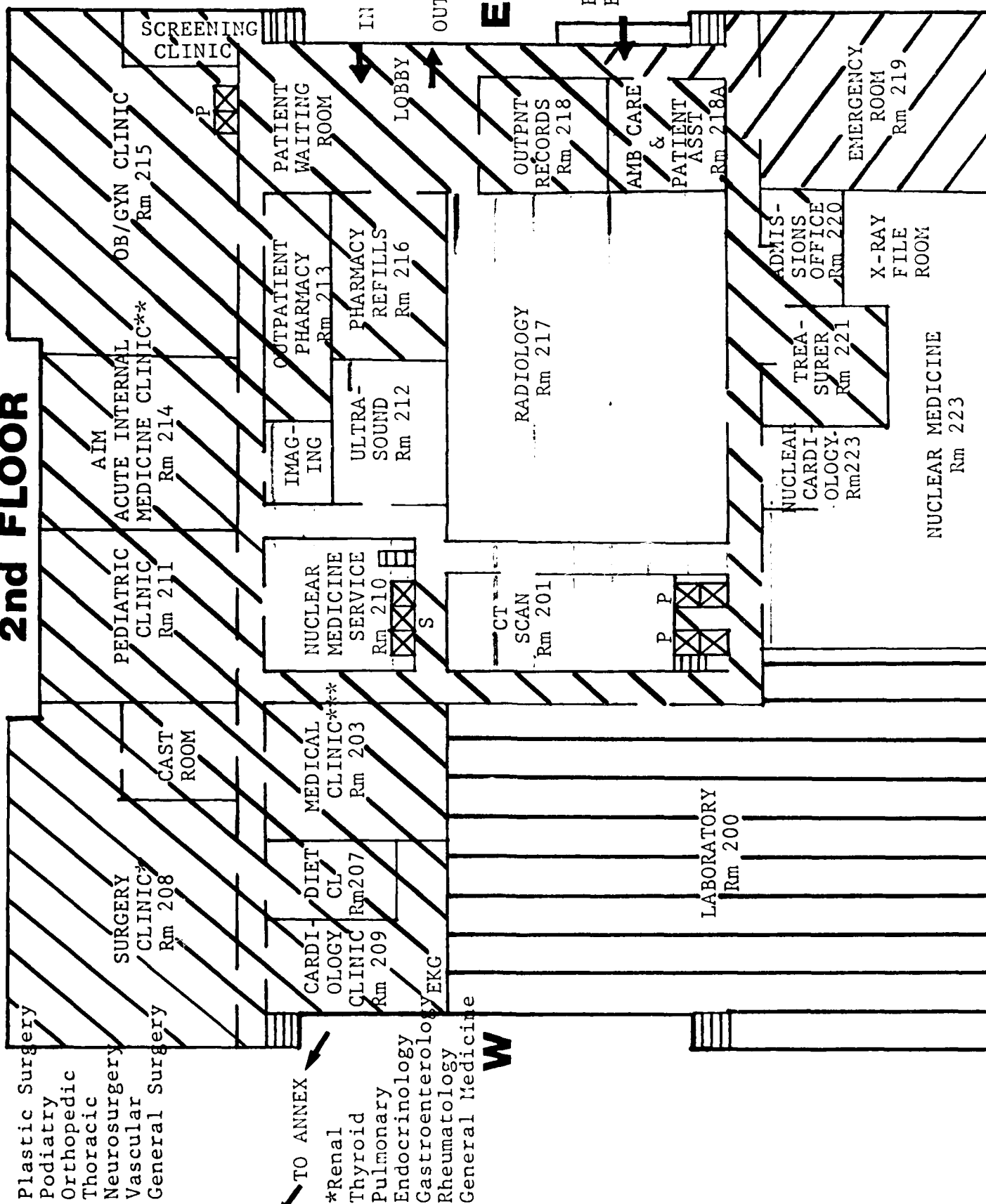
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**ELEVATORS**  
P Passenger  
S Service

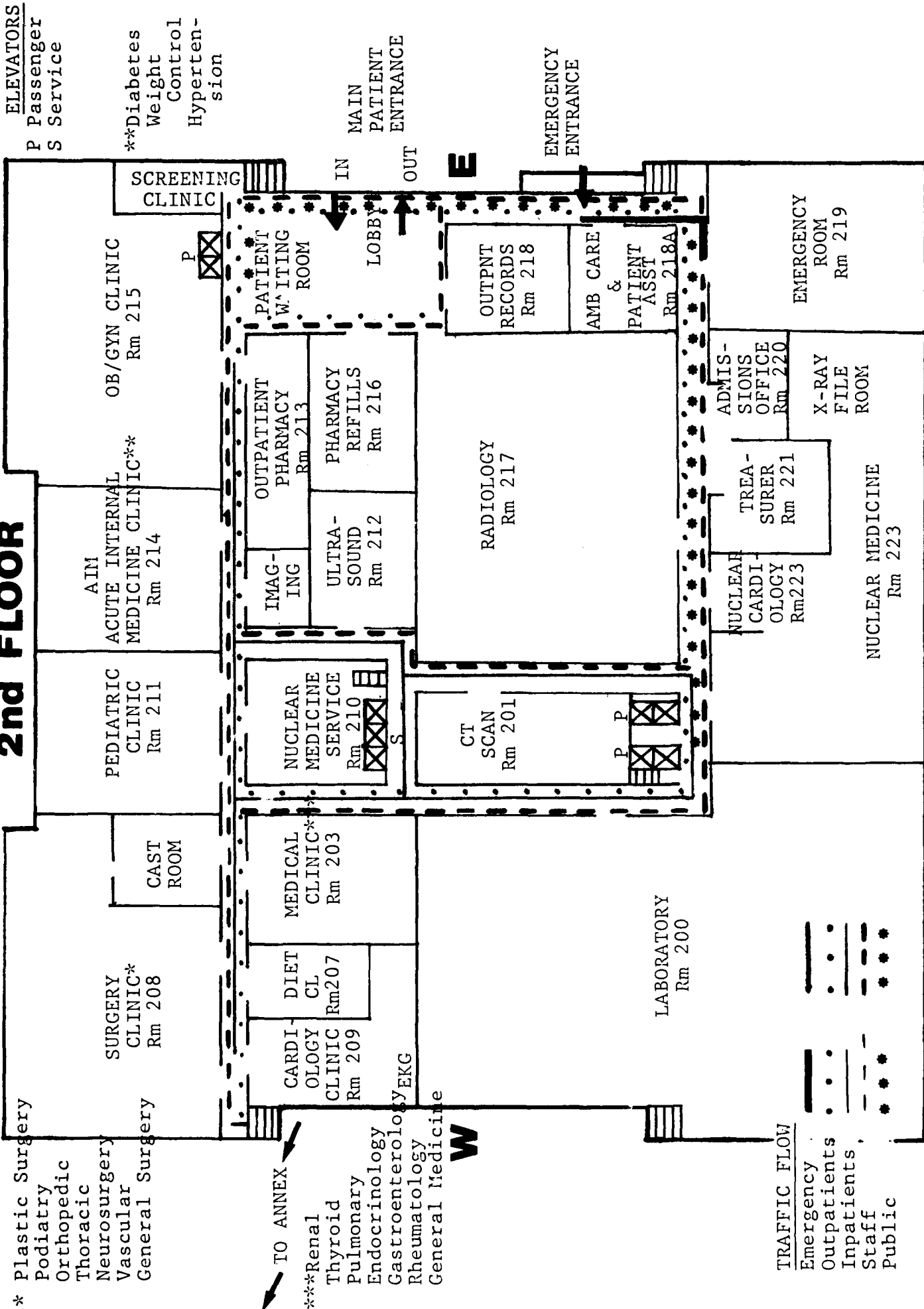
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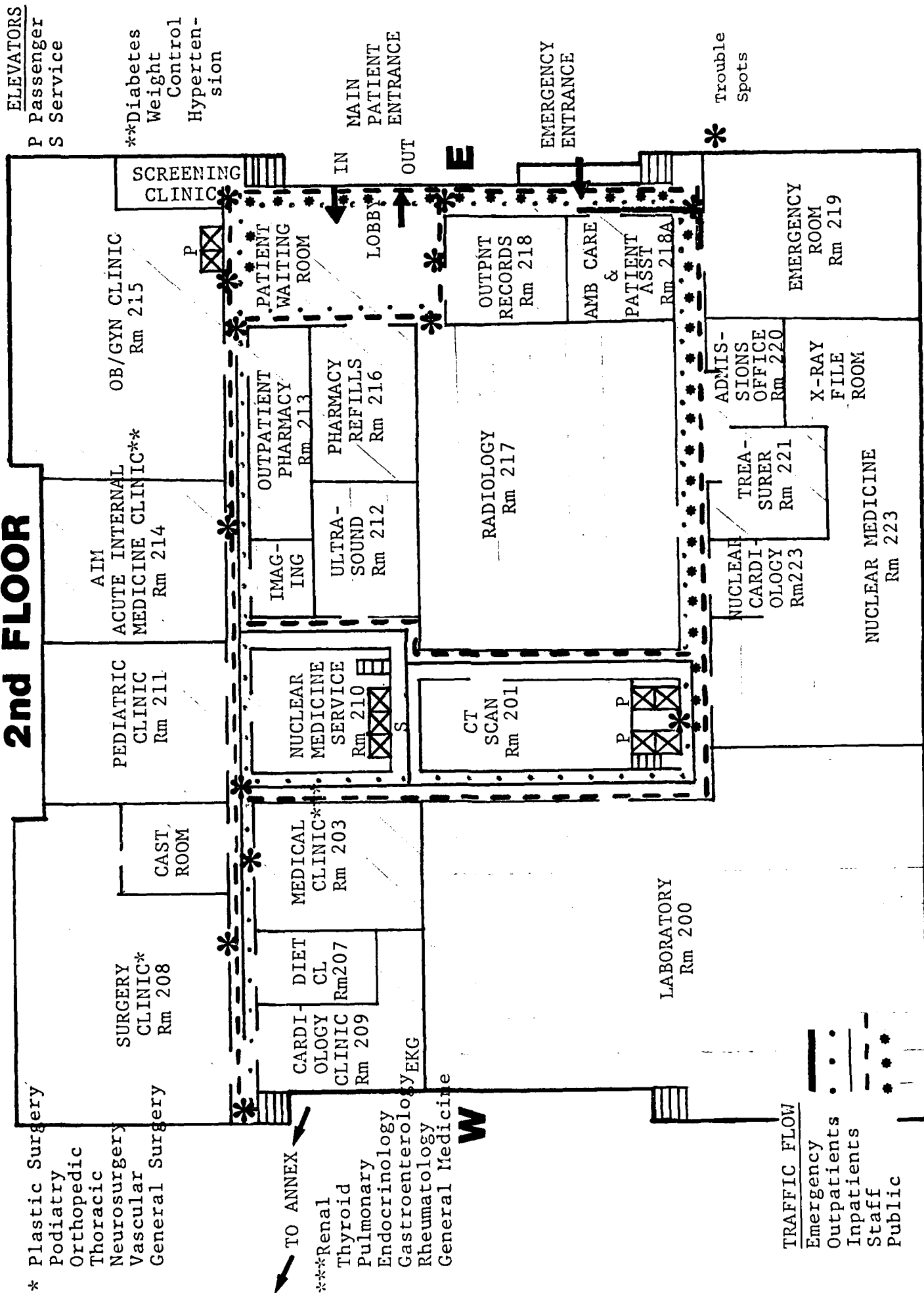
EMERGENCY  
ENTRANCE



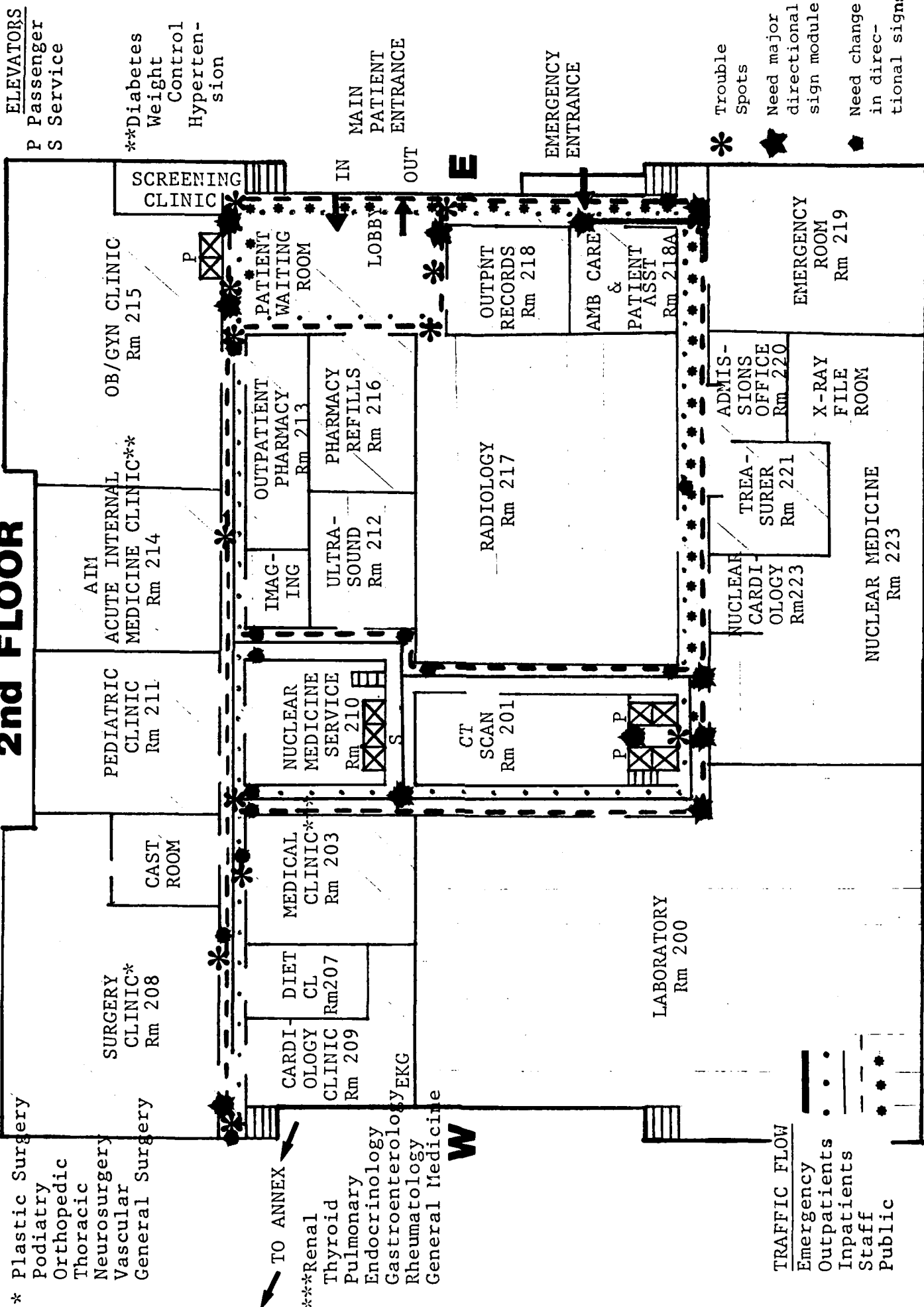
# 2nd FLOOR



# 2nd FLOOR



# 2nd FLOOR



APPENDIX C

STAFF SURVEY COMMENTS

STAFF SURVEY COMMENTS  
(27 May - 10 June 1983)

1. Have paper maps available for pick up at key locations which show the location of services inside and outside the hospital building.
2. Have large directories located by each patient elevator.
3. Have directories in each patient elevator listing services located on each floor.
4. Directories should list clinics in layman terms.
5. Use larger numbers by elevators to mark the floor number.
6. Use international signs and symbols.
7. Indicate on signs and at restrooms if they can accommodate handicapped personnel.
8. Indicate the building number on doors into buildings, especially the main hospital.
9. Put sign at the Information Desk which refers people to the Admissions Office after 2100.
10. Install an overhead sign for X-ray and Pharmacy above the entrance to the waiting room (when coming from the ALM Clinic).
11. Need better signs on 1st floor by the elevator (near Radiation Therapy) to direct personnel to services.
12. Need better directions to 1st floor services from the Morale Support Library.
13. Change Otolaryngology to ENT on signs.
14. Update sign in corridor behind Building 1016.

15. Add a sign at Physical Evaluation Board directing people to Physical Exam Section.

16. Add "Hearing" and "Eye" to signs for the Audiology Clinic and Ophthalmology Clinic.



APPENDIX D

RESULTS OF PATIENT SURVEY

GENERAL RESULTS OF PATIENT SURVEY ON HOSPITAL SIGNS  
(Conducted at LAMC)

1. 73% of patients entered the main patient entrance. (See Question 1 on Patient Survey on Hospital Signs)
2. 60% of patients having trouble finding the Records Room entered the main patient entrance. (Question 2)
3. 44% of patients went initially to the Screening Clinic, Acute Internal Medicine Clinic or Ob/Gyn Clinic. (Question 3a)
4. Only 10% of patients had difficulty finding their initial clinic from the Records Room. (Question 3b)
5. The initial clinics which were hardest to find were: Optometry, Screening, Acute Internal Medicine, Orthopedics, and ENT. (Question 3b)
6. 38% of patients were referred to another service from the initial clinic. (Question 4a)
7. Services most often referred to were Lab, X-ray, and Pharmacy (55%). (Question 4b)
8. Only 12% of patients had difficulty finding the clinic or service to which they were referred from their initial clinic. (Question 4c)
9. Physical Medicine and Brace and Limb Shop were the hardest to find of these services. (Question 4c)
10. 18% of patients had trouble finding other services. (Question 5a)
11. 70% of these patients having trouble could not find the Snack Bar or hospital PX. (Question 5b)
12. 46% of patients having trouble finding other services started from the 2nd floor lobby, while 72% started from either the 2nd floor lobby/entrance/elevators or other entrances/elevators. (Question 5c)

PATIENT SURVEY ON HOSPITAL SIGNS

The following information is requested in an attempt to improve our current interior sign system at Letterman. Your candid comments will help us to help you in finding your way around our hospital better in the future.

1. Place entered hospital (1st floor by Schwartz Theater, 2nd floor by main parking lot, 3rd floor front entrance, or 3rd floor rear entrance).

1st / 2nd / 3rd front / 3rd side (Circle correct response.)

2. While going to pick up your medical records, did you have difficulty in finding the Records Room from existing signs?

Yes / No / NA

3a. Which clinic did you initially visit? \_\_\_\_\_

b. Did you have difficulty finding it from existing signs? Yes / No

4a. Were you referred to another clinic or service? Yes / No

b. If so, which one(s)?

(1) Clinic \_\_\_\_\_

(2) Service \_\_\_\_\_  
(Pharmacy, X-ray, Lab, etc.)

(3) Hospital Annex \_\_\_\_\_  
(Patient Admin, Brace & Limb Shop, Social Work Service, etc.)

c. Did you have difficulty finding it from existing signs? Yes / No

5a. Did you have difficulty finding any other services, i.e. PX, snack bar, dining facility, Central Material Supply, etc., from existing signs? Yes / No

b. If yes, which one(s)? \_\_\_\_\_

c. If you had difficulty, from where did you start in order to find this service? \_\_\_\_\_

6. Please make additional remarks and suggestions concerning our signs on the reverse of this form.

Thank you for your comments! Please give this form to any clinic receptionist or the information desk upon your departure.

DETAILED RESULTS OF PATIENT SURVEY ON HOSPITAL SIGNS  
(Conducted at LAMC)

1,000 Survey forms distributed to patients  
620 forms returned  
62% response from patients

1. Place entered hospital?

2nd floor main entrance	400
1st floor side entrance	66
3rd floor front entrance	57
3rd floor side entrance	<u>22</u>
	545 patients

2. While going to pick up your medical records, did you have difficulty in finding the Records Room from existing signs?

Yes	25
No	455
NA	<u>101</u>
	581 patients

Patients having difficulty entered from:

2nd floor main entrance	15
3rd floor front entrance	6
3rd floor side entrance	2
1st floor side entrance	<u>2</u>
	25 patients

3a. Which clinic did you initially visit?

Screening	83
Acute Internal Medicine	82
Ob/Gyn	80
Ophthalmology	37
Cardiology	30
Pediatrics	29
ENT	22
Optometry	22
Medical	21
ER	20
Neurology	19
Gastroenterology	13
Orthopedic	13
Dermatology	10
Urology	10
Physical Medicine	9
General Surgery	7
Endocrinology	6
Physical Exam	5
Diabetes	5
Cardiovascular	5

Dental	5
Hematology	5
Renal Dialysis	4
Rheumatology	4
Immunology/Allergy	4
Audiology	3
Psychiatry	3
Pulmonary	2
	558 patients

3b. Did you have difficulty finding it from existing signs?

Yes	54
No	<u>504</u>
	558 patients

Patients having difficulty from Records Room to:

Optometry	7
Screening	7
Acute Internal Medicine	6
Orthopedic	5
ENT	5
Ophthalmology	2
Urology	2
Dermatology	2
Gastroenterology	2
Pediatrics	2
Cardiology	2
Other Clinics	<u>12</u>
	54 patients

4a. Were you referred to another clinic or service?

Yes	222
No	<u>355</u>
	577 patients

4b. If so, which one(s)?

Lab	75
X-ray	65
Pharmacy	63
Acute Internal Medicine	34
Physical Medicine	17
ENT	13
Brace & Limb Shop	11
Medical	10
Orthopedic	8
Urology	7
Patient Administration	7
Pediatrics	6
Cardiology	6
ER	5
Dermatology	5
Neurology	4

Rheumatology	4
Hematology	3
Podiatry	3
Screening	3
Ophthalmology	3
Diabetes	3
Allergy	3
Pulmonary	3
Dental	3
Social Work	2
Gastroenterology	2
Neurosurgery	1
Surgery	1
Cardiovascular	1
Medical Photography	<u>1</u>
	382 services

4c. Did you have difficulty finding it from existing signs?

Yes	45
No	<u>340</u>
	385 patients

Patients having difficulty:

(1)	<u>From</u>	<u>TO</u>	
	Screening	Acute Internal Medicine	4
	Orthopedic	Physical Medicine	3
	Information Desk	Optometry	3
	Other clinics	Other clinics	<u>35</u>
			45 patients

(2)	<u>TO (Totals)</u>	
	Physical Medicine	6
	Brace & Limb Shop	5
	Acute Internal Medicine	4
	Optometry	4
	X-ray	3
	Diabetes	3
	Immunization	3
	Lab	2
	Social Work	2
	ENT	2
	Other clinics	<u>11</u>
		45 patients

(3)	<u>FROM (Totals)</u>	
	Acute Internal Medicine	10
	Screening	7
	Orthopedic	4
	Information Desk	4
	Cardiology	3
	ENT	2

Neurosurgery	2
Rheumatology	2
Lab	2
Other clinics	<u>9</u>
	45 patients

5a. Did you have difficulty finding any other services from existing signs?

Yes	95
No	<u>431</u>
	526 patients

5b. If you, which one(s)?

Snack Bar	37
Hospital PX	30
Dining Room	10
Central Supply	12
Annex	<u>6</u>
	95 patients

5c. If you had difficulty, from where did you start in order to find this service?

(1) FROM	TO (Totals)	
2nd floor lobby/ elevator	Snack Bar	18
3rd floor elevator	Snack Bar	6
ER	Snack Bar	4
3rd floor front entrance	Snack Bar	2
Other locations	Snack Bar	<u>7</u>
		37
2nd floor entrance	Hospital PX	16
3rd floor elevator	Hospital PX	4
3rd floor front entrance	Hospital PX	2
ER	Hospital PX	2
Other locations	Hospital PX	<u>6</u>
		30
2nd floor entrance	Dining Room	5
Passenger elevators	Dining Room	3
Other locations	Dining Room	<u>2</u>
		10
2nd floor entrance	Central Supply	4
Passenger elevators	Central Supply	4
ER	Central Supply	2
Other locations	Central Supply	<u>2</u>
		12

Information Desk	Annex	TOTAL	$\frac{6}{95}$ patients
(2) <u>FROM (Totals)</u>			
2nd floor entrance		25	
2nd floor lobby		19	
All elevators		18	
ER		9	
3rd floor front entrance		6	
Information Desk		6	
Acute Internal Medicine		2	
Orthopedic		2	
Diabetes		2	
Other locations		$\frac{6}{95}$	patients

6. Please make additional remarks and suggestions concerning our signs on the reverse of this form.

Patient comments: (made by more than one patient)

1. Maps of the hospital and Annex should be available at key locations, i.e. elevators, entrances, clinics. Maps should include directions from hospital to Annex, plus list services and provide a floor plan. (9)
2. Passenger elevators should have directories in them. (4)
3. Directories should be located beside elevators on each floor. (4)
4. Signs are too small. (4)
5. Signs should include room numbers on them. (3)
6. Signs should be hung from the ceiling and mounted perpendicular to the walls. (2)
7. Add OT and PT to hallway Physical Medicine sign. (2)

Remarks received from 28 patients.

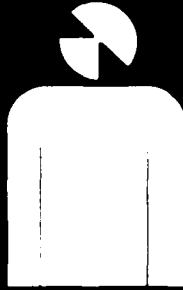


APPENDIX E

NEW GRAPHICS DESIGNED BY AUTHOR

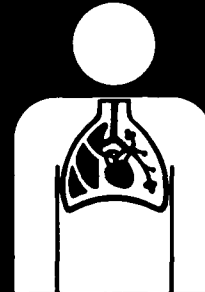
# Graphic Symbols

**Operating**



**Room**

**Thoracic**



**Surgery**

**Social Work**



**Service**

**Occupational**



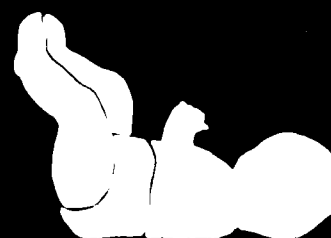
**Therapy**

**Speech and**



**Hearing Clinic**

**Nursery**



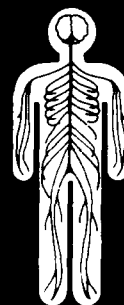
**Ward**

**Cardiovascular**



**Surgery**

**Nerve Care**



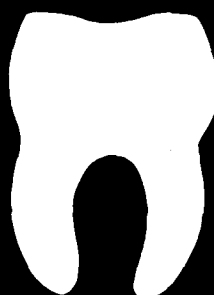
**Neurology**

**Psychiatry**



**Clinic**

**Dental**



**Clinic**

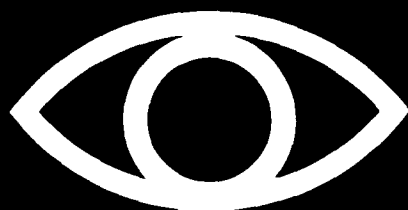
**Cast**



**Room**

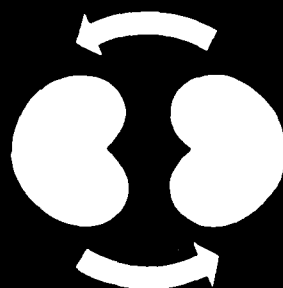


**Eye Clinic**



**Ophthalmology**

**Kidney**



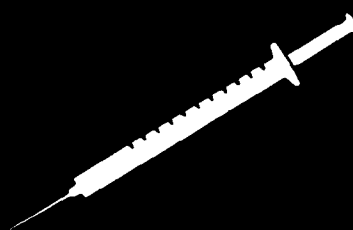
**Dialysis**

**Blood**



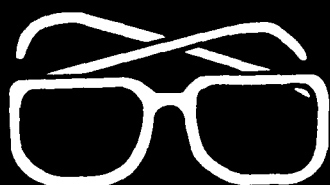
**Bank**

**Immunization**



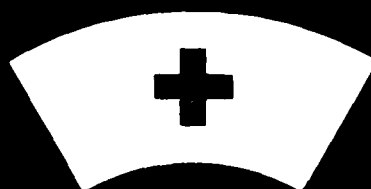
**Clinic**

**Optometry**



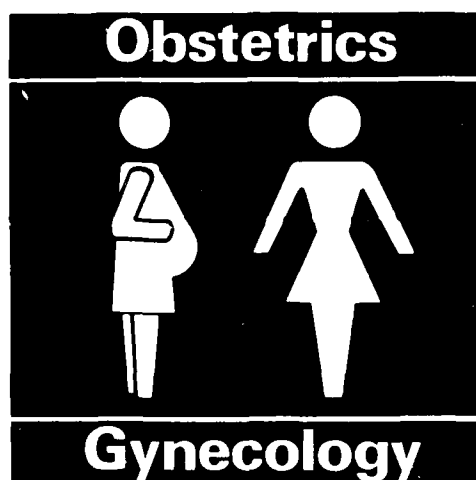
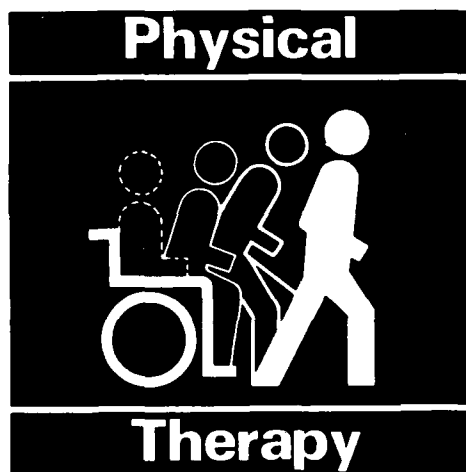
**Clinic**

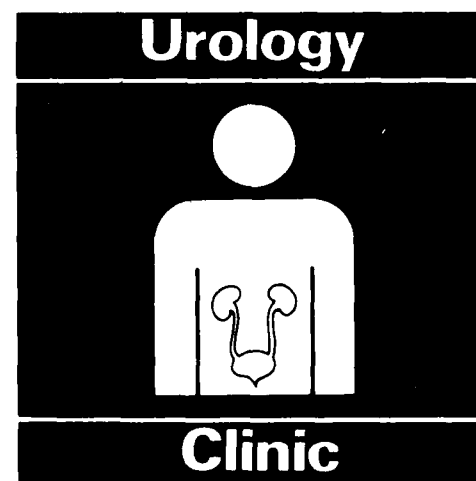
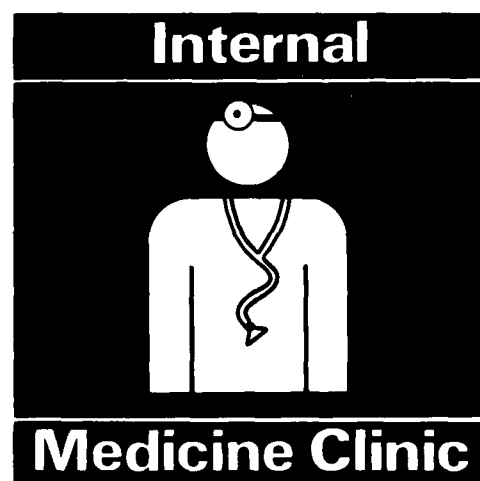
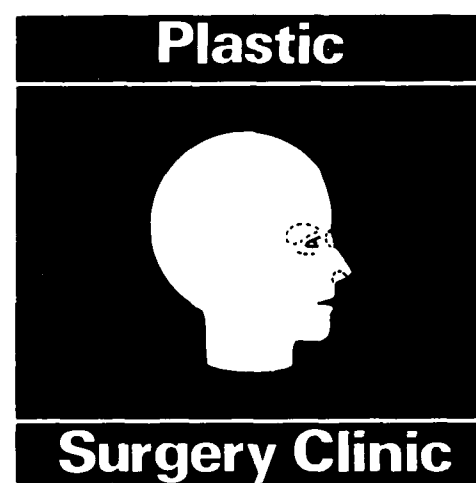
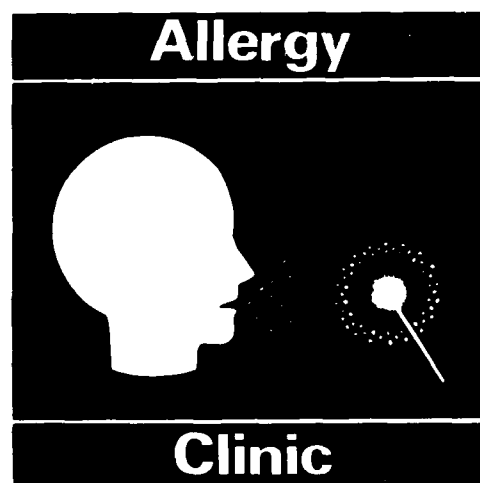
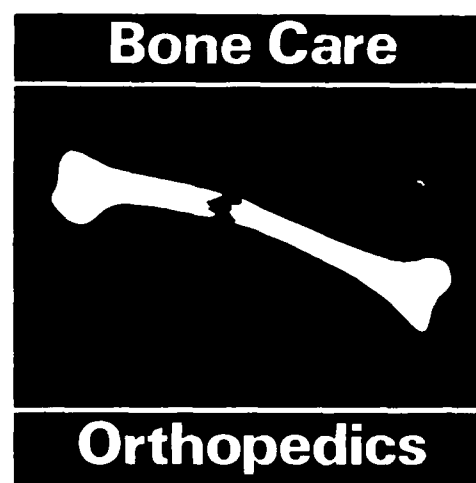
**Nurses**

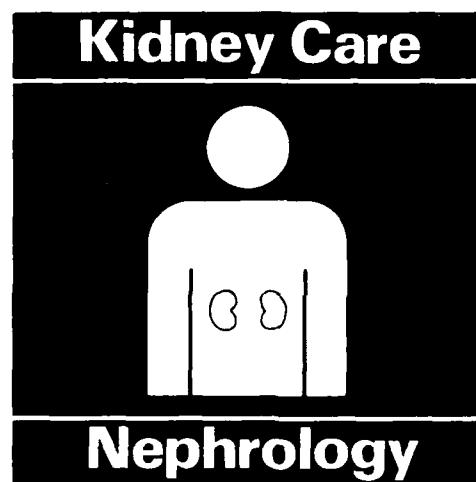
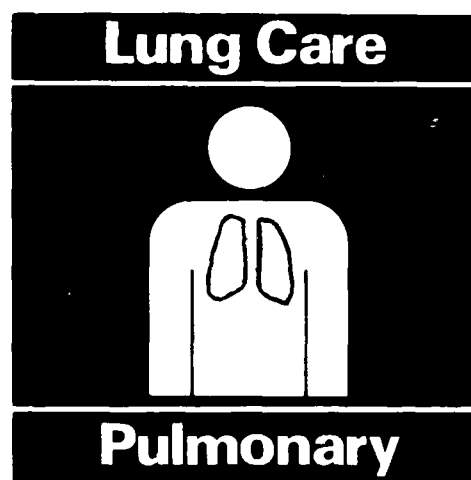
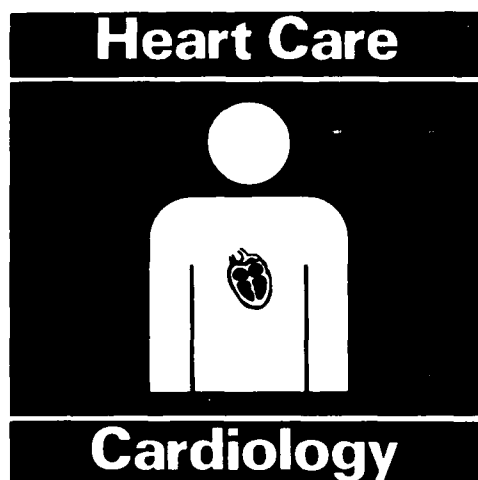


**Station**

# Graphic Symbols







APPENDIX F

COST-BENEFIT ANALYSIS





DEPARTMENT OF THE ARMY  
LETTERMAN ARMY MEDICAL CENTER  
PRESIDIO OF SAN FRANCISCO, CALIFORNIA 94129

REPLY TO  
ATTENTION OF:

MSHH-XIG

24 February 1984

MEMORANDUM FOR CHAIRMAN, SPECIAL PROJECTS COMMITTEE

SUBJECT: Hospital Directional Sign System

1. Requests for estimates on hospital directional signs were sent out to seven sign companies on 26 October 1983. Only four companies have submitted estimates. The requests for estimates specified engraved, vinyl die-cut, and silk-screened signs. There were 19 different types of signs and sign modules submitted which included pictographs when appropriate.
2. ENGRAVED SIGNS: Two of the four companies submitting estimates did not recommend engraved signs for our needs and did not provide an estimate on this type. One other company provided no bid since they specialize in vinyl lettering. The last company indicated that engraving was the most expensive method of production costing 20 - 30% more than silk-screening with little gain beyond aesthetics.
3. VINYL DIE-CUT SIGNS: Two companies recommended that vinyl not be used from an aesthetic and cost-effective standpoint. One states that vinyl is 106% more expensive than silk-screen. A sign-by-sign comparison of estimates submitted showed that vinyl was, in fact, more expensive than silk-screen in all cases ranging from 5% to 154% more in cost. Frames, brackets, and inserts are priced separately. Initial start-up cost with vinyl is about \$2000. to purchase the machine, letters, and tape to make your own signs. If pictographs are desired, then they must be produced commercially with the signs, i.e. you cannot make your own pictographs on your machine. Only one company provided a detailed estimate.
4. SILK-SCREENED SIGNS: Two companies provided detailed estimates with costs per sign being relatively comparable. Duplicate copies of signs with pictographs cost about one-half as much as the original sign. Sub-surfaced silk-screened messages cost 17% more than surface silk-screen copy. Pictographs increases the cost of the signs from 8% - 20%.
5. MISCELLANEOUS: The least expensive signs are those with a square cut plaque. Rounding the corners of a sign increases the cost from \$1.00 - \$2.40 per sign. Framing of signs is an additional cost.

HSHH-XIG

24 February 1984

SUBJECT: Hospital Directional Sign System

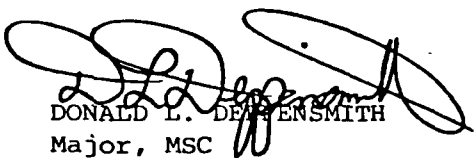
6. SUMMARY:

<u>PRODUCTION METHOD</u>	<u>COST</u>
SURFACE SILK-SCREEN	Cheapest
SUBSURFACE SILK-SCREEN	+ 17% over surface silk-screen
Paint-Filled Engraving	+ 30% "
Vinyl Die-Cut	+ 51% "

7. COST COMPARISON: Vinyl vs Silk-Screen (attached).

8. SIGN COMPANIES PROVIDING ESTIMATES:

Stanco, Inc.	Los Angeles, CA
ASI Sign Systems:	Diamond Sign Systems, Inc. Milpitas, CA
Evco Enterprises:	Sign Systems Burlingame, CA
Vomar Products, Inc.	Sepulveda, CA.

  
DONALD L. DEFFENSMITH  
Major, MSC  
Sign Project Officer

HSHH-XIG

24 February 1984

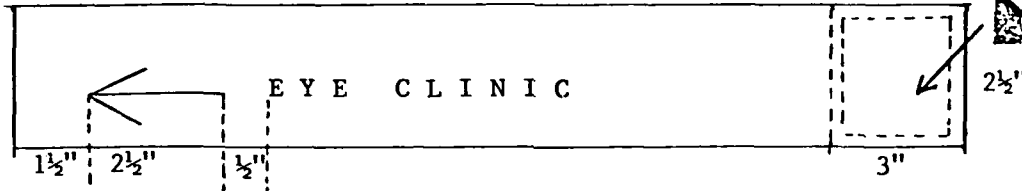
SUBJECT: Hospital Directional Sign System

COST COMPARISONVINYL VS SILK-SCREEN (same company)

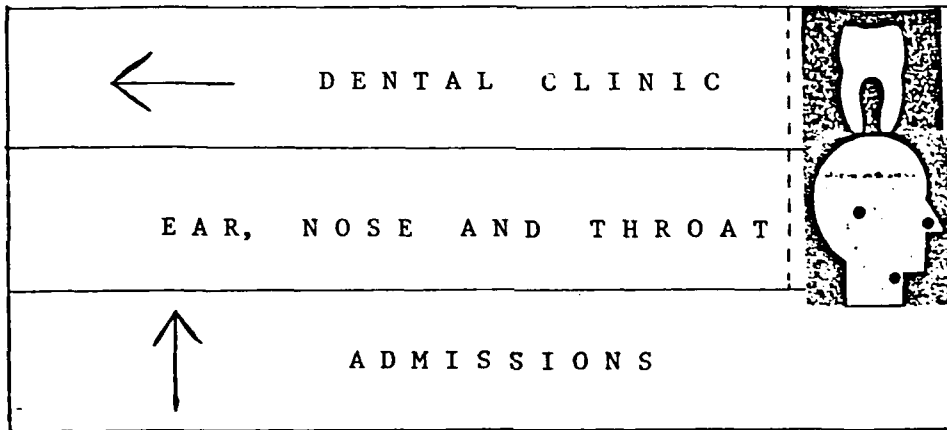
TYPE SIGN	COST PER SIGN WITH PICTOGRAPH: % COST			COST PER MODULE WITH PICTOGRAPH: % COST		
	DIFFERENCE	VINYL	SILK-SCREEN	DIFFERENCE	VINYL	SILK-SCREEN
a(1)				+ 56%	\$ 39	\$ 25
a(2)				+ 64	172	105
a(3)				+ 65	338	205
a(4)				+ 68	495	295
a(5)				+ 67	661	395
AVERAGE				+ 66		
b(1)				+ 21	85	70
b(2)				+ 33	326	245
b(3)				+ 41	619	440
AVERAGE				+ 36		
c(1)	+ 39%	\$ 110	\$ 79			
c(2)	+ 42	112	79			
c(3)	+150	60	24			
c(4)	+154	61	24			
AVERAGE	+ 66					
f(1)	+ 15	31	27			
f(2)	+ 5	42	40			
f(3)	+ 5	65	62			
AVERAGE	+ 7					
g(1)	+ 15	15	13			
g(2)	+ 25	20	16			
g(3)	+ 19	25	21			
AVERAGE	+ 20					
TOTAL OVERALL AVERAGE	+ 51%					
d(1)	+ 36%	\$ 49	\$ 36			
	(without pictograph)					
e(1)	NA	\$ 12	Not Available			
	(2' floor numbers)					

# SAMPLE SIGNS REQUIRING AN ESTIMATE

- a. (1) Size: 3" H x 24" L Wall Mounted  
 Lettering: 1 1/2" Pictograph: 2 1/2" x 2 1/2"  
 Arrow: 2" H x 2 1/2" L



- (2) Size: Approx 9" x 24" custom directional module  
 3 removable inserts, each 3" x 24" (as above),  
 framed, vandal proof, for wall mounting with screws.  
 Lettering: 1 1/2"  
 Pictograph: 2 1/2" x 2 1/2"  
 Arrows: 2" x 2 1/2" ← and 2 1/2" x 2" ↑



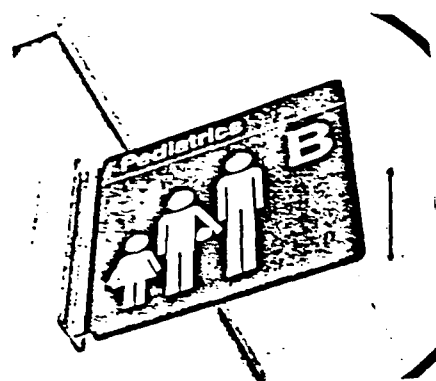
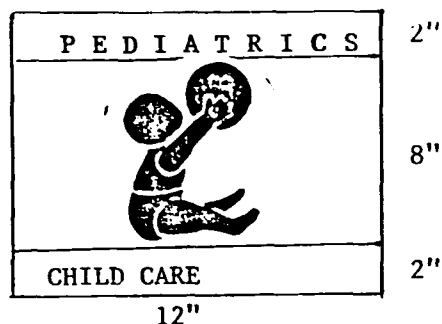
- (3) Size: Approx 18" x 24" custom directional module  
 6 removable inserts (as in a(1))  
 (4) Size: Approx 27" x 24" custom directional module  
 9 removable inserts (as in a(1))  
 (5) Size: Approx 36" x 24" custom directional module  
 12 removable inserts (as in a(1))

- b. (1) Size: 3" H x 24" L Ceiling Mounted  
 Same lettering both sides  
 Lettering: 1 1/2"  
 Pictograph: 2 1/2" x 2 1/2"  
 Arrow: 2" H x 2 1/2" L  
 As in a(1)

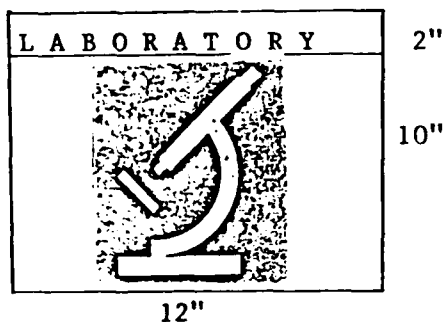
- (2) Size: Approx 9" x 24" custom directional module  
 3 removable inserts, each 3" x 24",  
 framed, vandal proof, for ceiling mounting with chains.  
 Lettering on both sides; may not be the same lettering.  
 As in a(2).

- (3) Size: Approx 18" x 24" custom directional module,  
 6 removable inserts, each 3" x 24" (As in b(2) above)

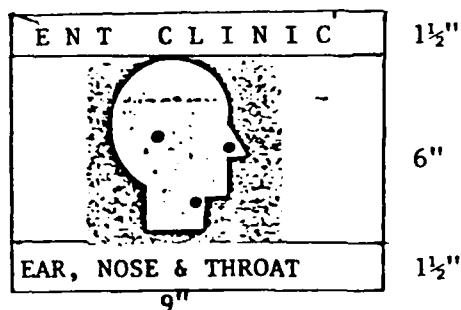
- c. (1) Size: 12" H x 12" L  
 Lettering: 1" centered  
 Pictograph: 8" x 8" centered  
 Insert, unframed, double-sided graphics, wall mounted projecting  
 bracket plaque (flexible), perpendicular to wall over door to  
 department, vandal proof.



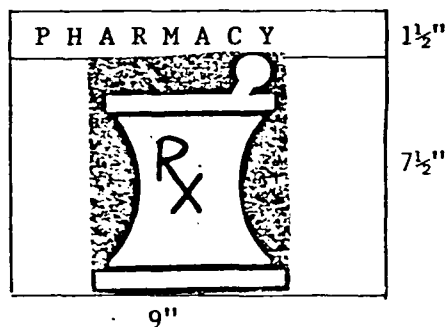
- (2) Size: 12" x 12"  
 Lettering: 1" centered  
 Pictograph: 10" x 10" centered  
 Same specifications as c(1) above



- (3) Size: 9" x 9"  
 Lettering: 5/8" centered  
 Pictograph: 6" x 6" centered  
 Wall mounted

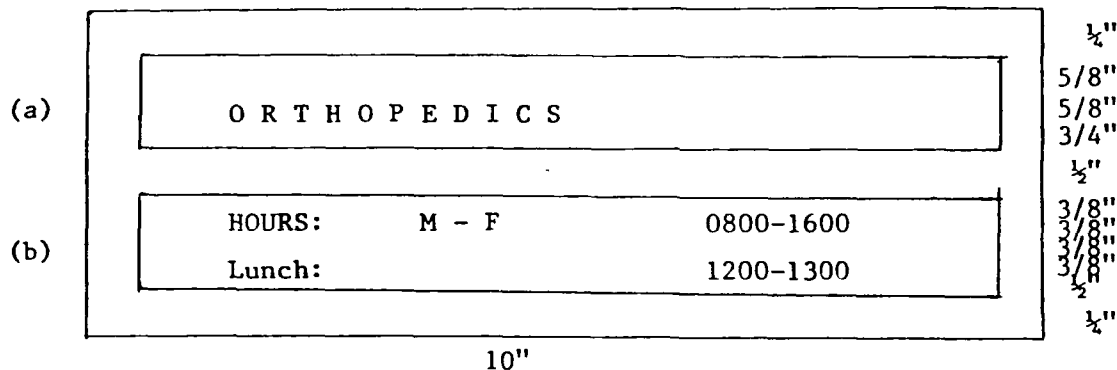


- (4) Size: 9" x 9"  
 Lettering: 5/8"  
 Pictograph: 7 1/2" x 7" centered  
 Wall mounted



- d. (1) Clinic identification sign with two slotted strips.

Size: 5" H x 10" L  
 Wall mounted  
 Lettering: 5/8" and 3/8" centered  
 No pictographs



- e. (1) Floor numbers to place on wall near elevators.

Size: 24" h  
 Vinyl numbers, black in color.

- f. Safety/Radiation standard signs  
 Wall mounted; standardized colors

- (1) Size: 7" x 10" or 10" x 7"  
 Lettering and pictographs to conform to OSHA and JCAH standards and sizes.

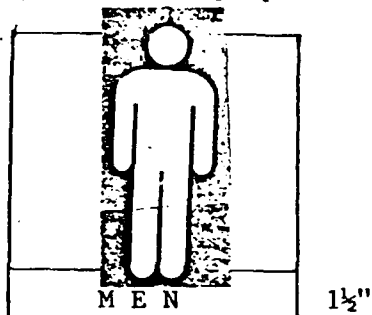
- (2) Size: 10" x 14" or 14" x 10"

- (3) Size: 14" x 20" or 20" x 14"

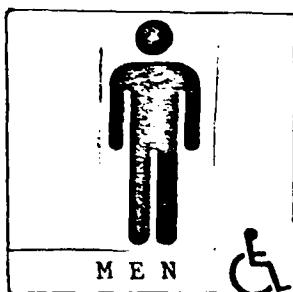
(Incl 5-1, 5-2 & 5-3)

9. Signs with International symbols and verbage

- (1) Size: 6" H x 6" L  
Wall mounted  
Lettering: Standard 3/8" centered  
Symbols/Pictographs: centered



- (2) Same as above with handicapped access symbol added to verbage line.



- (3) Prohibitory signs as above but red on white background with black lettering, i.e. No Smoking, No Entry, No Eating, etc.  
(Incl 5-1)

APPENDIX G

IMPLEMENTATION PLAN



## IMPLEMENTATION PLAN

An implementation plan was developed for phasing in the new signage system. It breaks the hospital signs into categories and prioritizes them for replacement. Budgeting constraints require that the system be phased in over time rather than purchased totally now. As money becomes available, the next category of signs will be replaced.

The implementation plan at LAMC is:

1. Directional signs in building 1100
  - a. Floor 1 (cost without installation \$8,040)
  - b. Floor 2 (\$9,990)
  - c. Floor 3 (\$20,245)
2. Directional signs in the Annex (\$9,980)
3. Identification signs in building 1100, floors 1-3 and in the Annex (\$7,923)
4. Cautionary signs in building 1100, floors 1-3 and in the Annex (\$3,920)
5. Information signs in building 1100, floors 1-3 and in the Annex (\$3,490)
6. Directional signs in building 1100, floors 4-10
7. Identification signs in building 1100, floors 4-10
8. Cautionary signs in building 1100, floors 4-10
9. Information signs in building 1100, floors 4-10
10. Building and floor directories
11. Elevator/stairway floor numbers
12. Patient room signs
13. Internal office signs

# DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO.

REFERENCE OR OFFICE SYMBOL	SUBJECT
HSHH-XIG	LAMC Sign System

TO Chairman, FROM MAJ Deppensmith DATE 19 Apr 84 CMT 1  
Special Projects Committee MAJ Deppensmith/blg/3106

A minimum estimate for the sign system is \$64,392. The following is a breakdown by locations and sign types. These estimates do not include installation costs.

1. Direction Sign Modules (1-12 inserts).

Hospital:

Floor 1

a(1) type	1 each	X \$ 25.	= \$ 25.
a(2)	6	105.	= 630.
a(3)	3	205.	= 615.
a(4)	5	295.	= 1475.
a(5)	11	395.	= 4345.
b(1)	1	70.	= 70.
b(3)	2	440.	= 880.

\$8040.

Floor 2

a(2)	4	105.	= 420.
a(3)	6	205.	= 1230.
a(4)	2	295.	= 590.
a(5)	19	395.	= 7505.
b(2)	1	245.	= 245.

\$9990.

Floor 3

a(2)	2	105.	= 210.
a(3)	20	205.	= 4100.
a(4)	3	295.	= 885.
a(5)	35	395.	= 13,825.
b(2)	5	245.	= 1225.

\$20,245.

Annex (Bldg. 1007-1009 and 1012-1016):

a(2) type	4 each	X \$105.	= \$420.
a(3)	10	205.	= 2050.
a(4)	1	295.	= 295.
a(5)	7	395.	= 2765.
b(2)	2	245.	= 490.
b(3)	9	440.	= 3960.

\$9980.

2. Clinic Identification Signs.

Hospital and Annex:

c(1) type	57 each	X \$ 79.	= \$4503.
c(3)	57	24.	= 1368.
d(1)	57	36.	= 2052.

\$7923.

HSHH-XIG

19 April 84

SUBJECT: LAMC Sign System

3. Elevator/Stairway Floor Numbers.

e(1) type	67 each	X	\$ 12.	=	<u>\$804.</u>
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4. Safety/Radiation Standard Signs.

f(1) type	40 each	X	\$ 27.	=	\$1080.
f(2)	40		40.	=	1600.
f(3)	20		62.	=	1240.
					<u>\$3920.</u>

5. International Signs.

g(1) type	70 each	X	\$ 13.	=	\$ 910.
g(2)	30		16.	=	480.
g(3)	100		21.	=	2100.
					<u>\$3490.</u>

\$64,392.

  
DONALD L. DEPPENSMTIH  
MAJ, MSC  
Sign Project Officer

SHH-XIG

Mid-Year Review Funds

/// THRU: DCA/Chairman, Special  
Projects Committee

MAJ Deppensmith

25 January 85

MAJ Deppensmith/blg/3106

TO: Comptroller

1. Request \$77,270 for upgrade of LAMC's internal directional sign system (on Floors 1 - 3 and the Annex) be added as an unfinanced requirement to the mid-year budget v
2. Hospital signs have remained basically unchanged since 1969. They vary in size, shape, color, location, distance from the floor, and method of attachment to the wall, door or ceiling. Lettering, also, varies in size, style and method of production. There is no uniformity throughout the hospital and Annex.
3. Discussion about an upgrade of the sign system began in 1980 in the Special Projects Committee. In 1982, the admin resident was assigned the task in order to save \$8800 which a consultant wanted to charge for doing a sign survey.
4. Estimates of various types of signs were obtained from four companies. It was determined that the silk-screen production method was best type. (Incl 1)
5. A minimum estimate for replacement of directional signs in the hospital (Floors 1 - 3) and in the Annex was \$64,392. This does not include installation which costs 15 - 20% more than the signs alone or another \$12,878. TOTAL = \$77,270 estimate (April 84) (Incl 2).
6. This sign system is still on the current status list of the Special Projects Committee.

2 Incl  
as

DONALD L. DEPPENSMITH  
MAJ, IG  
Inspector General

CF: C, Services Br.

10 May 85

LETTERMAN ARMY MEDICAL CENTER  
Activity: Inspector General (sign project officer)

PURCHASED SERVICES PROGRAM FY 1986

(1) <u>Description</u>	(2) <u>FY 1985 Program</u>	(3) <u>FY 1986 Projection</u>
Upgrade of hospital interior directional signage	0 (\$77,270 requested at mid-year review)	\$90,000

Instructions:

1. Considering changes in mission, staffing, equipment and technology, as well as known price increases, complete Column 3.
2. If amount in Column 3 differs from Column 2, explain.

Comments:

Upgrade of LAMC's internal directional signs (floors 1-3 & Annex) has been in the planning since 1980. Signs have remained basically unchanged since 1969. This has been an ongoing project of the Special Projects Committee. Use of the silk screening production was determined to be the best. See attached backup documentation.

projected cost (1984)	\$64,392
installation	<u>12,878</u>
total cost (1984)	\$77,270
estimated cost (1986 \$)	\$90,000

APPENDIX H

USER'S MANUAL FOR SIGNAGE SYSTEMS

(In Separate Binder)

# BIBLIOGRAPHY

## BIBLIOGRAPHY

### Books

- American Hospital Association. Signs and Graphics for Health Care Facilities. Chicago: American Hospital Association, 1979.
- Porter, David R. Hospital Architecture: Guidelines for Design and Renovation. Ann Arbor, MI: AUPHA Press, 1982.

### Articles and Periodicals

- "Bright, bold sign program directs people through hospital: Massachusetts Eye and Ear Infirmary. Hospitals, JAMA, Vol 49 (1 February 1975): 25.
- "Careful Design Provides Outpatient Facility with Simple, Clear, Attractive Signage and Graphics." Hospitals, Vol 53 (16 April 1979): 40, 44.
- Cleeremans, R.W. "Put Some Direction in Your Sign Program." Medical Group Management, Vol 28 (May-June 1981): 42-3.
- "Graphics ease eye patients through hospital." Hospitals, JAMA, Vol 50 (16 May 1976): 35.
- Hoffman, P. "Signs tell patients where to go." Modern Healthcare, Vol 5 (March 1976): 35.
- "Hospital Graphics". Graphis Magazine, (Zurich) Vol 34 (July-August 1978): 1-4, 195.
- "Hospital Graphics." Industrial Design, Vol 19 (April 1972): 3, 8, 9, 13.
- Klumb, Eugene C. "Hospital signs that everyone can understand." Modern Hospital, Vol 120 (May 1973): 96-8.
- Lipper, Carol. "Good signs can help control visitor and staff traffic." Modern Hospital, Vol 115 (July 1970): 83-7.
- "New signs unsnarl hospital maze." Hospitals, Vol 56 (16 October 1982): 32-3.
- Olson, Donald R. "What We Need is Another Sign." Medical Group Management, Vol 20 (March-April 1973): 18-20.



Page, M. "Signs and Symbols for Health Care Facilities." Interiors, Vol 131 (February 1972): 16.

"Pictographs to guide hospital visitors." Hospital, JAMA, Vol 46 (1 January 1972): 109.

Planck, R.W. "An Automated Graphics System." Interior Design, Vol 51 (November 1980): 250-3.

"Planning, Flexibility, and Growth Enable Hospitals' Signage Systems to Meet Many Needs." Hospitals, Vol 51 (16 July 1977): 54-8.

"Signage aids smart moves in medical center." Hospitals, Vol 53 (16 December 1979): 27, 30, 35.

"Signage system eases frustration." Hospitals, JAMA, Vol 48 (16 April 1974): 50-2.

#### Government Publications

Department of the Army. Technical Manual Number 5-838-2, Army Health Facility Design. (February 1979).

Department of the Army. Army Regulation Number 385-30, Safety Color Code Markings and Signs. (September 1983).

Letterman Army Medical Center, LAMC Regulation 420-30, Fabrication and Use of Signs (24 March 1981).

US Department of Labor, OSHA Safety and Health Standards (29 CFR 1910). "Safety Color Code Markings and Signs." OSHA 2206, 1910.144 and 1910.145 (June 1981).

US Department of Transportation, DOT-OS-60510, Symbol Signs. "The development of passenger/pedestrian oriented symbols for use in transportation-related facilities." Vol 2 (March 1979).

Veterans Administration, Office of Construction. Directional Graphics for VA Hospitals. Washington, D.C.: Superintendent of Documents, U.S. Government Printing Office, 1976.

FOOTNOTES

#### FOOTNOTES

- <sup>1</sup>R.W. Cleeremans, "Put Some Direction in Your Sign Program", Medical Group Management 28 (May-June 1981): 43.
- <sup>2</sup>David R. Porter, Hospital Architecture: Guidelines for Design and Renovation (Ann Arbor, MI: AUPHA Press, 1982), pp. 301-302.
- <sup>3</sup>American Hospital Association, Signs and Graphics for Health Care Facilities, (Chicago: American Hospital Association, 1979), p. 40.
- <sup>4</sup>R.W. Planck, "An Automated Graphics System," Interior Design 51 (November 1980): 250.
- <sup>5</sup>American Hospital Association, p. 52.
- <sup>6</sup>Ibid., p. 36.
- <sup>7</sup>Ibid., pp. 26-31.